

### Amendments to the Claims

Claim 1 (Currently amended): An optical gas sensor comprising a gas chamber for housing a sample gas; a gas opening for injecting the sample gas into the gas chamber or for exhausting the sample gas from the gas chamber; an infrared optical source for projecting infrared toward the sample gas; and an infrared sensor for sensing the intensity of the infrared which has passed through the sample gas, characterized in that: the wall of the gas chamber is composed of two opposing concave mirrors having different focusing distances but a common focus, and the concave mirrors have curvatures such that the incident light which is parallel to the axis of the concave mirror reflects on the surface of the concave mirror and passes through the common focus of the concave mirror, and that the incident light, which has passed through the common focus of the concave mirror reflects on the surface of the concave mirror and propagates parallel to the axis of the concave mirror.

Claim 2 (Currently amended): The optical gas sensor according to claim 1, wherein the gas opening comprise a gas vent located at a certain wall of the gas chamber and a plurality of gas diffusion ~~halls~~holes disposed on the lower or upper support plate of the gas chamber.

Claim 3 (Currently amended): The optical gas sensor according to claim ~~1~~or 2, wherein the plurality of gas diffusion ~~halls~~holes is covered by a gas filter.

Claim 4 (Currently amended): The optical gas sensor according to claim 3, wherein the

plurality of gas diffusion ~~halls~~holes are preferably disposed on the axis of the incident light from the infrared sensor.

Claim 5 (Currently amended): The optical gas sensor according to claim 2, wherein the gas vent is ~~advantageously~~ curved downward or equipped with a detachable cap.

Claim 6 (Original): The optical gas sensor according to claim 1, wherein the surface of the concave mirror is plated by or deposited with gold.

Claim 7 (Original): The optical gas sensor according to claim 2, wherein the gas chamber contains a parabolic reflecting mirror integrally formed with the support plate of the gas chamber adjacent to the infrared optical source formed at the support plate.

Claim 8 (Original): The optical gas sensor according to claim 7, wherein a light outlet for projecting at least a part of the infrared light from the infrared optical source is formed on the support plate of the gas chamber.

Claim 9 (Currently amended): The optical gas sensor according to claim 7 or 8, wherein the infrared optical source is disposed on the focus of the parabolic mirror.

Claim 10 (Currently amended): The optical gas sensor according to claim 2, wherein the lower support plate of the gas chamber is attached with a height compensation structure for

compensating the inclination of the support plate due to the height of the infrared optical source.

Claim 11 (Currently amended): An optical gas sensor comprising a gas chamber for housing a sample gas; a gas opening for injecting the sample gas into the gas chamber or for exhausting the sample gas from the gas chamber; an infrared optical source for projecting infrared toward the sample gas; and an infrared sensor for sensing the intensity of the infrared which has passed through the sample gas, characterized in that:  
the wall of the gas chamber is composed of two opposing concave mirrors having different focusing distances but a common focus.

Claim 12 (Currently amended): The optical gas sensor according to claim 11, wherein the gas opening comprise a gas vent located at a certain wall of the gas chamber and a plurality of gas diffusion ~~halls~~holes disposed on the lower or upper support plate of the gas chamber.

Claim 13 (Currently amended): The optical gas sensor according to claim ~~11~~ or 12, wherein the plurality of gas diffusion ~~halls~~holes are covered by gas filters.

Claim 14 (Original): The optical gas sensor according to claim 11, wherein the surface of the concave mirror is plated by or deposited with gold.

Claim 15 (Currently amended): The optical gas sensor according to claim 12, wherein the gas chamber contains a parabolic reflecting mirror formed so that the parabolic reflecting mirror

causes the incident light from the infrared optical source to propagate in parallel with the lower or upper ~~horizontal~~ support plate of the gas chamber.

Claim 16 (Original): An optical cavity for a non-dispersive infrared sensor, characterized in that:

the optical cavity is formed by two opposing concave mirrors, the cross-section of the concave mirror is a circular arc, the central points of the two circular arcs exist on the same axis, and the optical cavity is optically closed except for holes for optical source, optical detector, gas vent and gas diffusion.

Claim 17 (Original): The optical cavity according to claim 16, wherein the central point of each circular arc coincides with the middle point of the straight line going from one circular arc to the other circular arc.

Claim 18 (Original): The optical cavity according to claim 16 or 17, wherein the circular arcs have different radius from each other.

Claim 19 (Original): The optical cavity according to claim 18, wherein the central point of the circular arc having a longer radius exists outside of the circular arc having a shorter radius, and the central point of the circular arc having a shorter radius exists inside of the circular arc having a longer radius.

Claim 20 (Original): The optical cavity according to claim 19, wherein the optical source and the optical detector are located on a different circular arc, and an incident light from the optical source is irradiated in parallel with the axis on which the central points of the two circular arcs are located, reflected once on each of the circular arc and detected by the optical detector.

Claim 21 (Original): The optical cavity according to claim 20, wherein the parallel light irradiated from the optical source focuses on the circular arc where the optical detector is located.

Claim 22 (Original): The optical cavity according to claim 17, wherein the optical source and the optical detector are located on the same circular arc, and an incident light from the optical source is reflected odd number of times on each of the circular arc and detected by the optical detector.

Claim 23 (Original): The optical cavity according to claim 22, wherein the incident light from the optical source incidents to or adjacent to a center of the optical cavity, repeats convergence and divergence during the plurality of reflections and reaches the optical detector, and wherein the cross-sectional area of the light reaching the circular arc on which the optical detector is located is larger than that of the light irradiated from the optical source.

Claim 24 (Original): An optical cavity for a non-dispersive infrared sensor comprising:  
an optical source for irradiating infrared light;  
an optical detector for ultimately detecting the infrared light from the optical source;

an optical cavity formed by two opposing concave mirrors, wherein the cross-section of the concave mirror is a circular arc, the central points of the two circular arcs exist on the same axis, and the optical cavity is optically closed except for holes for optical source, optical detector, gas vent and gas diffusion;

an optical modulating means for controlling the infrared light irradiated from the optical source, wherein the optical modulating means has a pulse modulation time of 200-600 ms and turn-off time of 2 sec., 2.5 sec. and 3 sec.; and

an amplification means for amplifying an electrical signal from the optical detector.

Claim 25 (Original): The optical cavity according to claim 24, wherein the optical modulating means sets the optical source with a pulse modulation time of 200ms and turn-off time of 3sec.